

10/501, 148
07/13/04

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



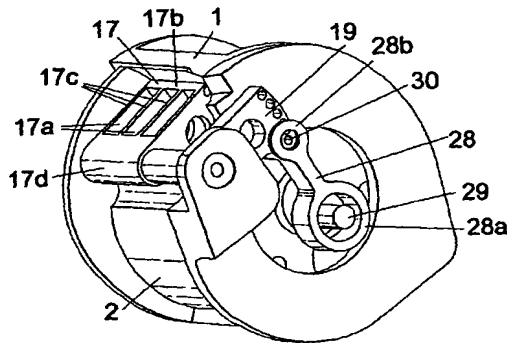
(43) International Publication Date
31 July 2003 (31.07.2003)

PCT

(10) International Publication Number
WO 03/062604 A3

- (51) International Patent Classification⁷: **F01C 1/46**, 1/39, 11/00, 19/00, 19/08, 21/00, 21/08, 21/16
- (21) International Application Number: PCT/GB03/00194
- (22) International Filing Date: 17 January 2003 (17.01.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
- | | | |
|-----------|------------------------------|----|
| 0200991.8 | 17 January 2002 (17.01.2002) | GB |
| 0211603.6 | 21 May 2002 (21.05.2002) | GB |
| 0216084.4 | 11 July 2002 (11.07.2002) | GB |
| 0222776.7 | 2 October 2002 (02.10.2002) | GB |
| 0225939.8 | 7 November 2002 (07.11.2002) | GB |
- (71) Applicant (for all designated States except US): **E.A. TECHNICAL SERVICES LIMITED** [GB/GB]; 7-9 Rydal Place,, Chatburn, Lancashire, BB7 4JY, (GB).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): **Driver, Ronald, W.** [GB/GB]; 9 Rydal Place,, Chatburn, Lancashire, BB7 4JY (GB).
- (54) Title: **ROTARY POSITIVE DISPLACEMENT MACHINE**
- (57) Abstract: A casing (1) of a rotary positive displacement machine with a circular cylindrical internal surface (3) delimits an operating chamber. A rotor (4) orbits about the axis of the internal surface (3). The rotor (4) has a circular cylindrical external surface (11), a generatrix of which is adjacent to the internal surface (3), a diametrically opposite genetrix being spaced from the internal surface (3). A vane member (17), mounted on the casing (1) and pivotable about a pivot axis parallel to the chamber axis, is accommodated in a fluid inlet/outlet aperture (18) in the casing, the vane member having a passageway (17a) communicating between the exterior of the casing and the operating chamber. The vane member (17) has an arcuate face (17b) coaxial with the pivot axis, end faces (17c) extending from respective lateral ends of the arcuate face (17b) towards the pivot axis, and a tip face (17g) adjacent the rotor (4), these faces (17b, 17c, 17g) being sealing faces with respect to corresponding surfaces of the aperture (18) and the rotor (4). A linkage (28) connects the vane member (17) to the rotor, the linkage being connected to the vane member by an articulation having an articulation axis (30) such that a plane containing the articulation axis (30) and the axis of the external surface (11) passes through the region of sealing contact.
- (74) Agent: **GODWIN, Edgar James**; Marks & CLERK, 57-60 Limcolns Inn Fields, London WC2A 3LS (GB).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:
— with international search report
- (88) Date of publication of the international search report:
27 November 2003

[Continued on next page]



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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International Application No

PC 1/GB 03/00194

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 F01C1/46 F01C1/39 F01C11/00 F01C19/00 F01C19/08
F01C21/00 F01C21/08 F01C21/16

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 F01C F04C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EP0-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3 081 707 A (WILMOTT MARSHALL JOHN) 19 March 1963 (1963-03-19)	1-10, 12-19, 24
Y	the whole document	11, 20-22
X	DE 77 480 C (OTTO KÜSTER) 16 October 1894 (1894-10-16)	1, 24, 25
Y	the whole document	2-7, 16-18, 26-35
X	CH 334 058 A (VOGT ALOIS DR JUR) 15 November 1958 (1958-11-15)	1, 15, 24
A	figures 1-3 page 3, line 1 - page 4, line 42 page 7, line 4 - line 84 claim 11	34, 35

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

° Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

23 July 2003

Date of mailing of the international search report

22. 08. 2003.

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Lequeux, F

INTERNATIONAL SEARCH REPORT

Int: nal Application No
PCT/GB 03/00194

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 3 895 609 A (ARMSTRONG JOHN M) 22 July 1975 (1975-07-22)	2-7
A	figures 1-6 column 5, line 9 - column 6, line 21 column 9, line 5 - line 52 ---	34,35
Y	WO 94 00680 A (FANJA LTD ; HEDELIN LARS (SE)) 6 January 1994 (1994-01-06)	11
A	figures 2-4 page 5, line 30 - page 7, line 5 ---	8-10
Y	DE 488 069 C (PATIAG PATENTVERWERTUNGS UND I) 24 December 1929 (1929-12-24)	16-18
A	figures 3,4 page 1, line 8 - line 14 page 2, line 85 - line 91 ---	33-35
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	figures 1,4 page 1, line 76 - line 80 ---	
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A	cited in the application figures 1,7,20,26 column 3, line 46 - line 61 column 1, line 8-16 column 6, line 34 - column 7, line 9 ---	12-14
Y	US 4 831 827 A (DRIVER RONALD W) 23 May 1989 (1989-05-23)	33-35
A	figures 1,9,13,19 column 1, line 4 - line 5 column 2, line 51 - line 61 column 5, line 40 - line 48 column 6, line 43 - column 7, line 67 ---	12-14
A	US 3 303 790 A (MCCRAY RICHARD A) 14 February 1967 (1967-02-14)	2-7
	figures 1,2,6,7 column 2, line 59 - column 4, line 51 column 7, line 1 - line 9 ---	
A	US 3 896 772 A (LYLE SAMUEL P) 29 July 1975 (1975-07-29)	2-6
	figures 1,6-8,10,14-16 column 3, line 16 - line 45 column 7, line 66 - column 11, line 51 ---	
A	BE 773 897 A (F C R COMPRESSORI ROTATIVI SOC) 31 January 1972 (1972-01-31)	8,9,25, 34,35
	figures 1-4 page 7, line 10 - line 12 page 8, line 15 - line 18 ---	
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INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 03/00194

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 01 20167 A (DRIVER RONALD WILLIAM ;DRIVER TECHNOLOGY LTD (GB)) 22 March 2001 (2001-03-22) figures 5-9 page 5, line 20 -page 7, line 9 -----	9-11
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A	GB 1 085 542 A (WILLIAM EDGAR STOREY) 4 October 1967 (1967-10-04) figure 1 -----	19
A	WO 92 09800 A (MORRISON ALLAN) 11 June 1992 (1992-06-11) figures 1,2 claims 1,8,10,12 -----	26-32
A	CH 657 665 A (PETER STILLHART FA) 15 September 1986 (1986-09-15) figures 1,2 -----	34,35

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB 03/00194

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-7,15-18,24-35

Rotary positive displacement machine with pivotable vane member and shutter mounted on the rotor ends

2. Claims: 1,8-14

Rotary positive displacement machine with pivotable vane member and slider around the casing

3. Claims: 1,19-23

Rotary positive displacement machine with pivotable vane member and rotor comprising a non-rotating part

INTERNATIONAL SEARCH REPORT

Int. Patent Application No

PCT/JP 03/00194

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